

## CLAIMS

What is claimed is:

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1. In a communications system having a first modem pool for communicating with a second modem pool, each modem pool comprising a plurality of modems and having at least one NEXT cancellation filter, a method for modem wake-up comprising the steps of:
- during a first time period:
- a) activating at least one of the modems in said first modem pool;
  - b) deactivating at least one of the modems in said second modem pool;
- for at least one target modem in said first modem pool:
- c) activating said first modem pool NEXT canceller filter;
  - d) measuring the NEXT transfer function for said target modem and at least one other disturber modem in said first modem pool;
- during a second time period:
- e) activating at least one of the modems in said second modem pool;
  - f) deactivating at least one of the modems in said first modem pool;
- for at least one target modem in said second modem pool:
- g) activating said second modem pool NEXT canceller filter; and
  - h) measuring the NEXT transfer function for said target modem and at least one other disturber modem in said second modem pool.
2. A method according to claim 1 wherein said time periods are of an equal duration.
3. A method according to claim 1 wherein said time periods are of different durations.
4. A method according to claim 1 wherein either of said activating steps a) and e)

comprises activating said modems such that their transmitted signal occupies the entire usable bandwidth of said communications channel.

5. A method according to claim 4 wherein either of said activating steps a) and e) comprises activating said modems at either of their maximum transmission rate and their maximum power.
6. A method according to claim 1 and further comprising the steps of:  
 establishing a system control channel between said modem pools;  
 communicating a predetermined wake-up time limit from one of said modem pools to the other of said modem pools via said control channel; and  
 setting each of said time periods to the length of said wake-up time limit.
7. A method according to claim 1 and further comprising the step of setting a predetermined wake-up time limit for both of said modem pools.
8. A method according to claim 7 wherein said setting step comprises setting said time limits to an equal duration.
9. A method according to claim 7 wherein said setting step comprises setting said time limits to different durations.
10. A method according to claim 1 wherein said activating steps a) and e) comprise activating said modems at their maximum transmission rate and maximum power.

11. A method according to claim 1 wherein said measuring steps comprise measuring said NEXT transfer functions in either of the time domain and the frequency domain.
12. A method according to claim 1 wherein said first modem pool is located at a central office and wherein said second modem pool is located at a remote terminal.
13. A method according to claim 1 wherein said first modem pool is located at a remote terminal and wherein said second modem pool is located at a central office.
14. In a communications system having a modem pool comprising a plurality of modems for communicating via a communications channel, said modem pool having at least one NEXT cancellation filter, a method for modem wake-up comprising the steps of:
  - a) activating at least one of the modems in said modem pool;
  - b) preventing communications via said communications channel;for at least one target modem in said modem pool:
  - c) activating said modem pool NEXT canceller filter; and
  - d) measuring the NEXT transfer function for said target modem and at least one other disturber modem in said modem pool.
15. A method according to claim 14 wherein said activating step a) comprises activating said modems such that their transmitted signal occupies the entire usable bandwidth of said communications channel.
16. A method according to claim 15 wherein said activating step a) comprises activating said modems at either of their maximum transmission rate and their maximum power.

17. A method according to claim 14 wherein said measuring steps comprise measuring said NEXT transfer functions in either of the time domain and the frequency domain.

18. A method according to claim 14 wherein said modem pool is located at either of a central office and a remote terminal.

19. In a communications system having a first modem pool for communicating with a second modem pool, each modem pool comprising a plurality of modems and having at least one NEXT cancellation filter, a method for modem wake-up comprising the steps of:

during a first time period:

a) deactivating at least one of the modems in said second modem pool;

for at least one target modem in said first modem pool:

b) setting said target modem to receive-only mode;

c) activating at least one other modem in said first modem pool;

d) activating said first modem pool NEXT canceller filter;

e) measuring the NEXT transfer function for said target modem and at

least one other disturber modem in said first modem pool;

during a second time period:

f) deactivating at least one of the modems in said first modem pool;

for at least one target modem in said second modem pool:

g) setting said target modem to receive-only mode;

h) activating at least one other modem in said second modem pool;

i) activating said second modem pool NEXT canceller filter; and

j) measuring the NEXT transfer function for said target modem and at

least one other disturber modem in said second modem pool.

20. A method according to claim 19 wherein either of said activating steps c) and h) comprises activating said modems such that their transmitted signal occupies the entire usable bandwidth of said communications channel.

21. A method according to claim 20 wherein either of said activating steps c) and h) comprises activating said modems at either of their maximum transmission rate and their maximum power.

22. A method according to claim 19 and further comprising the steps of:  
 establishing a system control channel between said modem pools;  
 communicating a predetermined wake-up time limit from one of said modem pools to the other of said modem pools via said control channel; and  
 setting each of said time periods to the length of said wake-up time limit.

23. A method according to claim 19 wherein said activating steps c) and h) comprise activating said modems at their maximum transmission rate and maximum power.

24. A method according to claim 19 wherein said measuring steps comprise measuring said NEXT transfer functions in either of the time domain and the frequency domain.

25. A method according to claim 19 wherein said first modem pool is located at a central office and wherein said second modem pool is located at a remote terminal.

26. A method according to claim 19 wherein said first modem pool is located at a remote terminal and wherein said second modem pool is located at a central office.

27. In a communications system having a modem pool comprising a plurality of modems for communicating via a communications channel, said modem pool having at least one NEXT cancellation filter, a method for modem wake-up comprising the steps of:

for at least one target modem in said modem pool:

- a) setting said target modem to receive-only mode;
- b) activating at least one other modem in said modem pool;
- c) preventing communications via said communications channel;
- d) activating said modem pool NEXT canceller filter; and
- e) measuring the NEXT transfer function for said target modem and at least one other disturber modem in said modem pool.

28. A method according to claim 27 wherein said activating step b) comprises activating said modems at their maximum transmission rate and maximum power.

29. A method according to claim 27 wherein said measuring steps comprise measuring said NEXT transfer functions in either of the time domain and the frequency domain.

30. A method according to claim 27 wherein said modem pool is located at either of a central office and a remote terminal.

31. A communications system configured for NEXT cancellation, comprising:  
a communications channel;  
a modem pool comprising a plurality of modems for communicating via said

communications channel; and

at least one NEXT cancellation filter operative to measure the NEXT transfer function for for at least one target modem in said modem pool and at least one other disturber modem in said modem pool in the absence of communications to said modem pool via said communications channel.

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32. A system according to claim 31 wherein said modems are operative to transmit a signal via said communications channel, wherein said signals occupy the entire usable bandwidth of said communications channel.

33. A system according to claim 32 wherein said modems are operative at either of their maximum transmission rate and their maximum power.

34. A system according to claim 31 wherein said NEXT cancellation filter is operative to measure said NEXT transfer functions in either of the time domain and the frequency domain.

35. A system according to claim 31 wherein said modem pool is located at either of a central office and a remote terminal.

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36. A communications system configured for NEXT cancellation, comprising:  
a communications channel;  
a modem pool comprising a plurality of modems for communicating via said communications channel; and  
at least one NEXT cancellation filter operative to measure the NEXT transfer function for for at least one target modem in said modem pool, said target modem operating in a receive-only

mode, and at least one other disturber modem in said modem pool in the absence of communications to said modem pool via said communications channel.

37. A system according to claim 36 wherein said modems are operative to transmit a signal via said communications channel, wherein said signals occupy the entire usable bandwidth of said communications channel.

38. A system according to claim 37 wherein said modems are operative at either of their maximum transmission rate and their maximum power.

39. A system according to claim 36 wherein said NEXT cancellation filter is operative to measure said NEXT transfer functions in either of the time domain and the frequency domain.

40. A system according to claim 36 wherein said modem pool is located at either of a central office and a remote terminal.